Claims

B1 1. A wave device for supporting electromagnetic waves, the device including:

a first pair of inputs for setting up a first standing wave therebetween;

a second pair of inputs for setting up a second standing wave therebetween and positioned such that the input signal of each of the first and second pairs of inputs is unaffected by the state or impedance of the other of the first and second pairs of inputs; and

an output positioned so as to receive power from both the first and second standing waves. (Where is the output in the fig?

2. A wave device according to ~~claim~~ 1 including a conductive plate for supporting the first and second standing waves.

3. A wave device according to claim 2 wherein the plate B1 is mounted parallel to a grounded structure and is separated from the grounded structure by a dielectric.

4. A wave device according to claim 3 wherein the device is constructed as a microstrip structure or a stripline structure.

SUB A1 5. A wave device according to claim 2, 3 or 4, wherein the plate is a polygon having an even number of sides and each respective pair of inputs is connected across an opposing pair of sides.

6. A wave device according to claim 2, 3 or 4, wherein the plate is circular and each respective pair of inputs is connected to the plate across a diameter of the plate.

7. A wave device according to any preceding claim wherein the output is positioned at substantially the antinode of the device.

8. A wave device according to any preceding claim wherein the distance between a pair of inputs equals an integer number of the wave length of the wave transmitted by the inputs.

9. A wave device according to any preceding claim further comprising power dividers for providing the pairs of inputs from the signal sources.

10. A wave device according to any preceding claim further comprising one or more additional pairs of inputs for setting up additional respective standing waves.

11. A method of operating the wave device of any preceding claim as a splitter, the method providing a power input at the output of the wave device and receiving divided power output from the first and second pairs of inputs.

12. A method of combining electromagnetic waves comprising:

arranging a first pair of inputs across a wave device so as to set up a first standing wave therebetween;

arranging a second pair of inputs across the wave device so as to set up a second standing wave therebetween such that the input independence of each of the first and second pairs of inputs is unaffected by the other of the first and second pairs of inputs; and

arranging an output at a position on the wave device so as to receive power from both the first and second

standing waves.